

L. HOWARD.
HOT AIR FURNACE.
APPLICATION FILED AUG. 29, 1908.

953,465.

Patented Mar. 29, 1910.
2 SHEETS—SHEET 1.

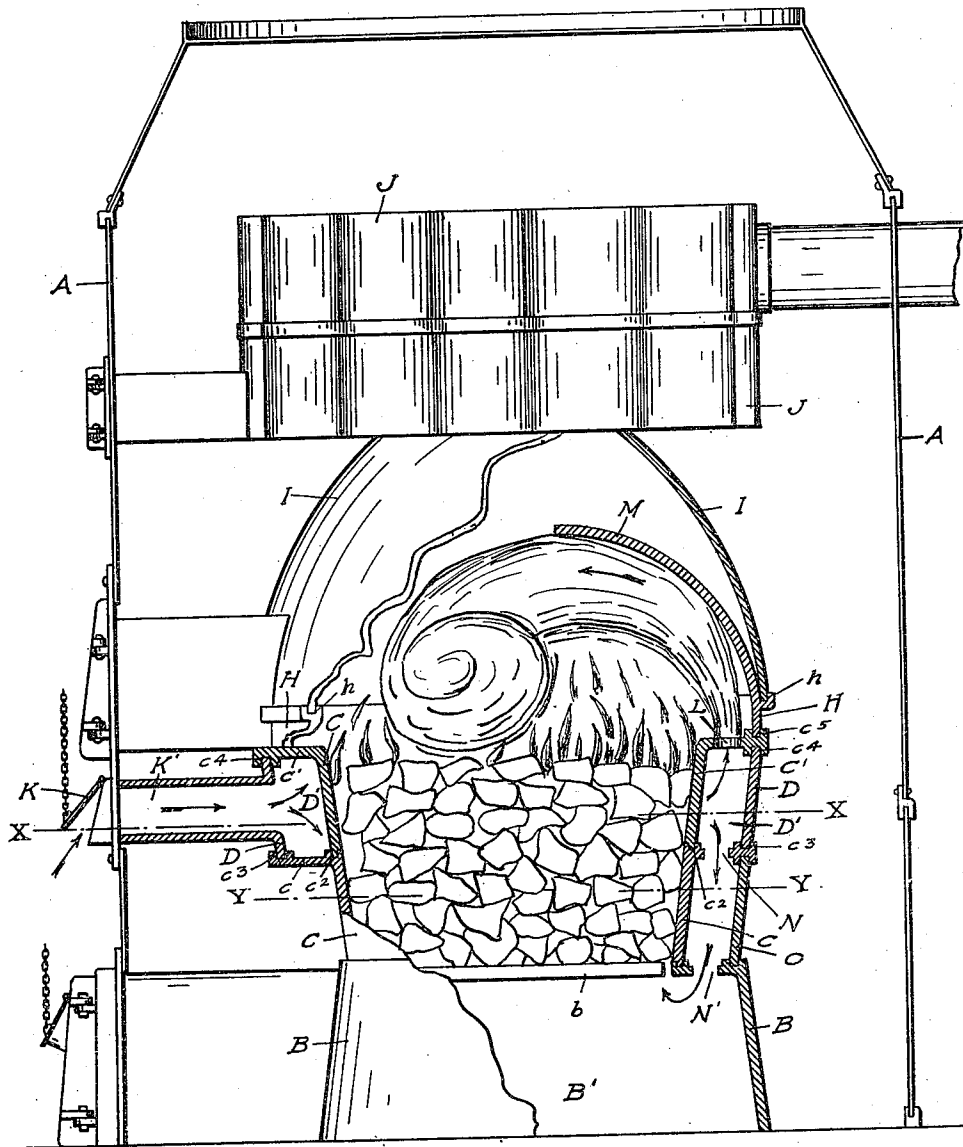


Fig. 1.

WITNESSES:

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C. O. Gibbons

INVENTOR:

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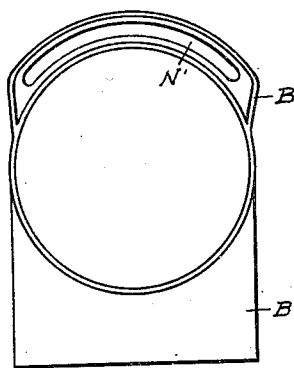


Fig. 2.

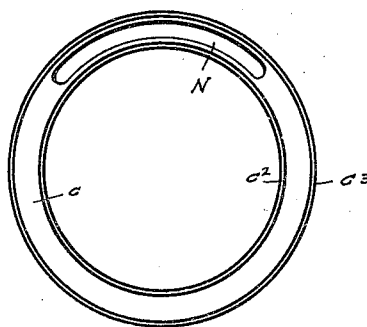


Fig. 3.

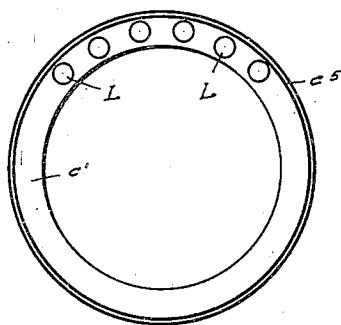


Fig. 4.

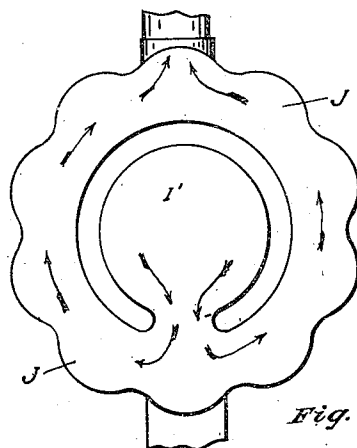


Fig. 5.

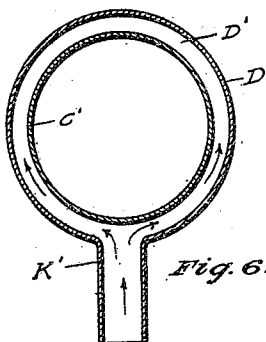


Fig. 6.

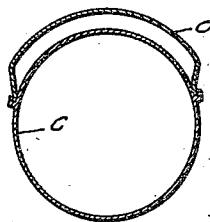


Fig. 7.

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UNITED STATES PATENT OFFICE.

LINCOLN HOWARD, OF SAVANNAH, MISSOURI.

HOT-AIR FURNACE.

953,465.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed August 29, 1908. Serial No. 450,841.

To all whom it may concern:

Be it known that I, LINCOLN HOWARD, a citizen of the United States, residing at Savannah, in the county of Andrew and State of Missouri, have invented certain new and useful Improvements in a Hot-Air Furnace, of which the following is a specification.

The object of my invention is to provide a hot air furnace that by reason of its construction will both intensify the heat and economize fuel.

I accomplish my object by the mechanism illustrated in the accompanying drawings, in which:—

Figure 1 is a sectional elevation of the furnace, the fire pot broken away, showing the interior thereof; Fig. 2 is a plan of the ash pit casting showing the draft opening; Fig. 3 is a plan of the lower fire pot casting, also showing draft opening; Fig. 4 is a plan of the upper fire pot casting showing draft ports in the same; Fig. 5 is a plan view of the corrugated heat radiating device, arrows indicating course of the smoke and heat gases; Fig. 6 is a cross section of the fire pot and outer band as seen on line $x-x$ in Fig. 1, and Fig. 7 is a cross section of the fire pot and a lower outer rear wall on line $y-y$ in Fig. 1.

Similar letters refer to similar parts in the several views.

A is an outer jacket around the furnace.

B is the base which forms an ash pit B' and supports the fire pot, combustion chamber walls, cap and radiator of the device.

C is a lower section of the fire pot and C' an upper section of said fire pot. Said sections are respectively provided with flanges c and c' . The top inner edge of flange c is provided with a groove c^2 to receive the upper section of the fire pot, thus making a complete fire pot. The top of the outer edge of said flange is provided with a similar groove c^3 in which a curved band D fits, forming a space D' around said upper section of the fire pot. The outer edge of flange c' is provided with a lower groove c^4 to receive the upper edge of band D, and with an upper groove c^5 to receive that sec-

tion of the combustion chamber wall H to which is fastened, or cast, the diaphragm check draft M.

h is a supporting groove cast on section H of the combustion chamber.

I is an upper section of the combustion chamber wall.

I' is a deep cap to the upper section of the wall of the combustion chamber, as shown in Fig. 5, and is cast as a part of the radiator J; it also serves as a cavity, or passage, through which heat produced by the burning of gas and smoke passes from the combustion chamber to said radiator.

K is a draft door and K' is a draft tube formed by a part of band D. The draft admitted through the draft door K and draft tube K' passes through said space D' and becomes highly heated in passing to the rear of the fire pot, the larger part passing thence through a plurality of ports L L in the back part of the flange c' of the fire pot into the combustion chamber under the diaphragm check draft M where it is forced to mingle with and burn the gases and smoke coked out of the fuel, while the smaller part passes down through a semi-circular opening N, as shown in Fig. 3, in the flange at the back part of the section C of the fire pot; thence down through a similar opening N', as shown in Fig. 2, in the rear of base B; thence up through the grate b to start and keep up the coking and gas making process.

O is a curved iron band, as shown in Fig. 7, joining the flange of section C of fire pot to base B forming a passage for so much of the draft as goes down through the semi-circular openings N and N'. The inner wall of said radiator is perfectly smooth while the outer wall is corrugated, as shown in Fig. 5, for the dual purpose of causing the heat to rebound from side to side and to increase the radiating surface.

The air heated in draft tube K' passes from the tube into the space around the fire pot. Here its temperature continues to increase; it is then ready to be admitted to the fire and enters the combustion chamber at the rear through openings L L in the flange in the back part in the upper section

of the fire pot. The volume of air thus admitted has been greatly expanded by its rise in temperature and rushes into the large combustion chamber with great force. By means of the diaphragm check draft this preheated air is deflected toward the fire and forced to mingle with the combustible smoke and gases arising from the fuel. The amount of draft passing downward is only sufficient to keep the fire alive and keep up the coking and gas making process.

I reserve the right to make the radiator in one or two pieces, and from either cast iron or steel and to make any alterations in my device that are merely mechanical.

What I claim and desire to secure by Letters Patent, is:—

1. The combination in a hot air furnace, of a base provided with a semi-circular opening at the rear, a lower section of fire pot supported on said base and an outwardly projected flange thereon provided with a semi-circular opening therein and inner and outer grooves on the top thereof, an upper section of fire pot seated in said inner groove and an outwardly projected flange thereon provided with a plurality of ports therein and upper and lower grooves at the outer edge thereof, an outer curved band spaced from said upper section of the fire pot, a lower curved iron band spaced from said lower section of the fire pot said upper band being seated in the groove in the outer edge of the flange on the lower section of the fire pot and the groove underneath the outer edge of the flange on the upper section of the fire pot, said lower curved band joining the outer edge of the flange of the lower section of the fire pot and the base, said space between the upper section of the fire pot and the upper curved band forming a chamber around the fire pot through which the draft passes, a part of the heated air passing up through said ports in the flange in the upper section of the fire pot while a part of the heated air passes down through the semi-circular opening in the flange on the lower section of the fire pot and thence through a similar opening in the top of the rear of the base into said base and up through the grate, a draft tube formed by a projection of said upper band, a lower section of the combustion chamber wall seated in the top groove in the flange in said upper section of the fire pot, a baffle plate integral with the inside of said section of combustion chamber wall, a cap forming a fire pot dome and a radiator having connection with said dome through which radiator heat from the combustion chamber passes, substantially as described and shown.

2. The combination in a hot air furnace of a base having a grate and an ash pit pro-

vided with a semi-circular opening rearward of the grate, a lower fire pot section supported by said base having a semi-circular opening and an outwardly extending flange at the top thereof said flange being provided with an upper and lower groove upon the periphery of the upper and lower faces thereof and a groove at the upper, inner edge thereof, an upper fire pot section seated in said upper inner groove having an outwardly extending flange at the top thereof said flange also being provided with an upper and lower groove upon the periphery of the upper and lower faces thereof, a supporting member seated on said base engaging with the lower groove upon the periphery of the lower face of the lower fire pot section flange, a curved band spaced from the upper fire pot section seated in the groove on the upper face of said periphery of the flange of said lower fire pot section and engaging with the groove on the lower face of the upper section fire pot flange periphery, a lower section of the combustion chamber wall supported in the groove on the upper face of said upper fire pot section flange periphery and provided with a supporting groove cast integral on the outside thereof, an upper section of combustion chamber wall seated in said supporting groove, a baffle plate rigid with the lower part of the combustion chamber wall, a draft tube formed by a projection of said curved band a draft door at the front end of said tube and means for carrying off the products of combustion, substantially as shown and set forth.

3. A hot air furnace comprising the necessary draft and smoke inlets and outlets, a base, a fire pot consisting of upper and lower sections the upper section being provided with an outward flange having a groove in the upper face of its periphery, a lower section of rear combustion chamber wall seated in said groove said section of wall having a supporting groove integral therewith upon its outer surface, an upper section of combustion chamber wall seated in said groove on the lower section of wall and a baffle plate carried on the top edge of the lower section of the combustion chamber wall, substantially as shown and set forth.

4. In a hot air furnace having the necessary draft inlets and outlets the combination with a base therefor, a fire pot provided at the top with an outward flange having a groove on the upper face of its periphery, a grate at the base of said fire pot, a radiator and the cap thereof, of a section of the combustion chamber wall seated in said groove and provided with a horizontal groove on its rear surface, an upper section of combustion chamber wall seated in said horizontal groove

and extending upward and forward into
connection with said radiator and a baffle
plate carried on the top edge of the section
of combustion chamber wall having said
5 groove on its rear surface, said baffle plate
bearing upwardly and forwardly over said
fire pot, substantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

LINCOLN HOWARD.

Witnesses:

O. S. PAYNE,

T. O. HAWKINS.